Visit the WSDOT CEVP® and CRA website at:

www.wsdot.wa.gov/Projects/ProjectMgmt/RiskAssessment

Washington State
Department of Transportation

Implementation of risk based estimating, such as CEVP®

The implementation of CEVP® at WSDOT has been a positive and valuable experience. One reason for the success of CEVP® at WSDOT is that its implementation is happening concurrently with a commitment to an established project management approach, Executive Order Number E 1032.00, July 1, 2005.

The project management process, tools and templates can be found at:

www.wsdot.wa.gov/Projects/ProjectMgmt

What's Next?

WSDOT's commitment to project management excellence continues. The Cost Risk Estimating Management efforts continue to expand the use of CEVP® and CRA as well as continuing to improve the process. In addition we are exploring development of a risk database and how to use risk based estimating for portfolios of projects.

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2006 Update
WSDOT Cost Estimate Validation Process (CEVP®)

January 2006

General Information

The CEVP® approach uses a probabilistic-based assessment of the estimated cost and schedule to complete a project. The process is collaborative where input from the project team and independent internal and external Subject Matter Experts (SMEs) is obtained. The process focuses on the project team for both input of primary information and applying workshop results to more effectively manage their projects. WSDOT has developed the Cost Estimate Validation Process (CEVP®) and Cost Risk Assessment (CRA) to identify, assess and evaluate risk that could impact cost and/or schedule during project delivery.

A general comparison of a few typical characteristics for CRA and CEVP®

Workshop Type → / Characteristic ↓	CRA	CEVP®
Workshop length	1 – 2 days	3 – 5 days
Subject Matter Experts	Internal and local	Internal and external
Timing (when to hold workshop)	Anytime. Typically updated when design changes or other changes to the project warrant an updated CRA.	Best to start early in the process, major projects are typically updated as needed.
General	An assessment of risks with an evaluation and update of costs and schedule estimates.	An intense workshop that provides an external validation of cost and schedule estimates and assesses risks.

CEVP® - is a registered trademark of WSDOT.

Historical Timeline

2002 – WSDOT develops and implements the "Cost Estimate Validation Process".

2003 – The process is scaled for use on smaller projects using CRA.

2004 – Number of workshops climb and interest continues to grow.

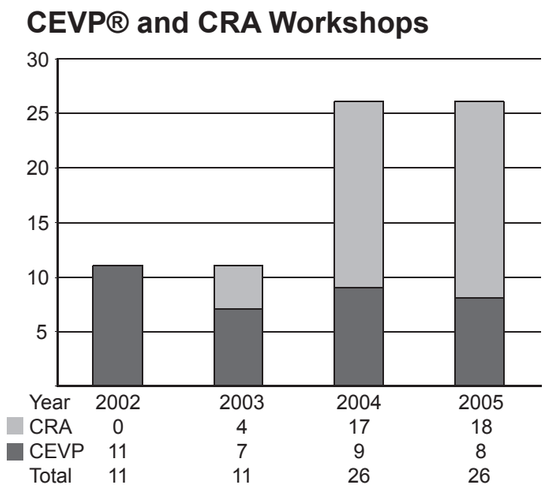
2005 – Summer: Project Management On-Line Guide deployed with Executive Order; A Policy for CRA and CEVP®, established; Fall: A Risk Management Plan (RMP) spreadsheet tool is made available.

2006 – Currently: Exploring development of portfolio risk modeling tool; exploring development of risk database and metrics for performance of the program; exploring ways to increase the efficiency and effectiveness of CEVP®. 2006 TRB conference.

Status of Program

Since WSDOT began using CEVP® and Cost Risk Assessment workshops for risk based estimating over 70 workshops have been conducted. The program is strong and growing and in calendar year 2006 it is expected that over 30 workshops will be conducted having already conducted two workshops this month.

FIGURE 1: Workshops by Calendar Year



Workshop Application (scalability)

The smallest workshop to date has been a one day CRA workshop for the SR 106 Skobob Creek Bridge project with an estimate cost range under $2 million. Larger projects range from the tens of millions to projects in the billions. By scaling the size of the workshop team, which is a collaboration of the project team, subject matter experts, and the cost-risk team, the process has demonstrated its value for a wide variety of project types and sizes. Truly the application of risk based estimating at WSDOT is scalable to the project needs.

Benefits of CEVP® and CRA

Numerous benefits have been reaped from the implementation of CEVP® at WSDOT. One major benefit is the enhanced communication resulting from the workshop results. This has allowed WSDOT to change the character of discourse with regard to early cost declarations. Emphasizing the fact that an estimate is a range not a number, the word estimate has been reclaimed for its true meaning. The use of the one-page summary (example provided on facing page), has received positive feedback.

- CEVP® and CRA answer the two fundamental questions of project management: How much will it cost? And how long will it take? In addition the workshop process and the resulting output provide project managers the information needed to also answer "Why" the project cost and schedule falls within the estimated range.
- The risk ranking provided by workshop output helps the project manager to know where to focus his/her team's efforts.
- The ability to act pro-actively on risk items and track the risks for which no pre-emptive action can be taken is helpful.
- It provides a running start into development of the risk management plan component of the project management work plan.
- Project Managers do not have to grapple alone with the issues they encounter on their projects and their associated risks.
- Project teams receive a peer review and analysis of the project cost and schedule estimates.
- Project teams receive ideas on potential response strategies for major risks.
- Internal communication is enhanced resulting in increased understanding of project scope, schedule, and budget.
- Project managers are better prepared for the unexpected.

SR 520 Bridge Replacement and HOV Project

Cost Estimate Validation Process (CEVP)

Updated Fall 2005

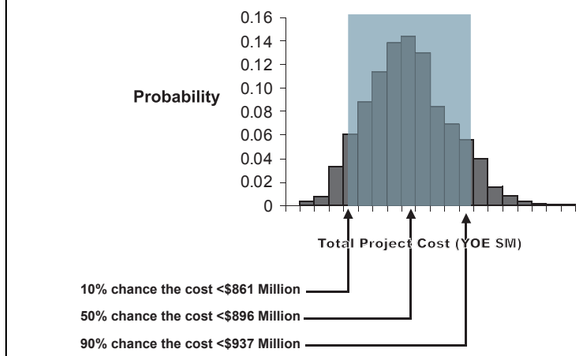
4-Lane Alternative

2 General Purpose Lanes in each direction

Project Description

- Rebuilds the existing four-lane freeway from I-5 in Seattle to Bellevue Way with 2 lanes in each direction and full width shoulders
- Rebuilds the Evergreen Point Bridge and the Portage Bay Bridge
- Rebuilds existing westbound HOV lane from 108th to the east end of the Evergreen Point Bridge
- Rebuilds outside lane transit stops at Montlake, Evergreen Pt. Road, & 92nd
- Adds HOV access onto the I-5 express lanes to downtown Seattle
- Adds bicycle/pedestrian path
- Adds electronic toll collection
- Includes pontoons sized to carry future High Capacity Transit

Project Cost Range*



Project Benefits

- Reduces seismic and storm damage risks to the Evergreen Point and Portage Bay bridges
- Improves safety and reliability by adding full shoulders
- Maintains current highway capacity and serves 7% more people in 13% fewer vehicles during the peak evening travel time as compared to the No Build alternative
- Provides increased transit benefit with new SR 520 to I-5 express lanes connection and improved SR 520 transit stops
- Improves environmental quality by removing "ramps to nowhere" in Arboretum area, improving water quality by treating storm water, and reducing noise in communities by adding sound walls
- Creates new path for bicycles and pedestrians
- Accommodates future High Capacity Transit across Lake Washington

Project Risks

- Limited number of qualified and available contractors and changes in market conditions
- Changes in local street improvement requirements
- Uncertainties in: right-of-way costs, bridge structure costs, and geotechnical findings
- Cultural resources identified
- Legal challenges to the Environmental Impact Statement (EIS)
- Delays in construction permitting
- Delays in funding

Project Schedule

- Begin construction: 2009 to 2010
- New bridge open to traffic: 2013 to 2015
- End construction: 2015 to 2017

What's Changed Since 2004 CEVP

- **Scope:** No change
- **Schedule:** Design schedule assumes plans contract ready for Evergreen Point Bridge replacement in spring of 2008. Construction schedule assumes availability of full construction funding, completion of a new pontoon construction site, and construction on the Evergreen Point Bridge starting in 2009.
- **Cost:** Base project costs range from a decrease of $29m to an increase of $58m. Changes include opportunities for bridge construction efficiencies, increases in structure costs, and construction related mark-ups.

Key Financial Assumptions

- Project costs assume an unconstrained cash flow from the following sources: Nickel gas tax, TPA gas tax, a regional funding package, tolling, and other sources to be determined
- Design funding available by 7/05 and construction funding by 1/08
- Inflation escalation is to 2013, approximate midpoint of construction
- Year of Expenditure (YOE) is 2013
- Project cost range includes $33 million in expenses to date

Level of Project Design: Low | Medium | High

Conducted June 2005

Washington State Department of Transportation